

Dimensional Variation in SS 17-4 PH Binder Jetted Components

Venkat Roy
Indo-MIM Inc.
San Antonio, TX, USA

Mukund Nagaraj
Indo-MIM Inc.
San Antonio, TX, USA

ABSTRACT

This paper aims to study the dimensional variation of SS 17-4 PH parts printed using a binder jet printer. Test specimens are printed across the build-box and the variation in dimensions was recorded after the necessary post-printing processes like curing, de-powdering, de-binding, and sintering. In addition to charting the sintered dimension variation from the print location, the green condition variation was also tracked to correlate its effect on sintered dimensions. The results from this study showed that some green parameters like weight can be used to predict the variation in final stage sintered dimensions. Tolerances were derived for a component with complex geometry and there were under 2% barring one dimensional measurement that was sensitive to sintering distortions.

1. INTRODUCTION

Additive manufacturing processes have provided an avenue to manufacture metal components with highly complex and customized geometries. Although they are currently being utilized for tool making, prototyping, or low-volume production, some of these processes are moving towards mass production, specifically the Binder Jetting (BJT) process which is relatively more scalable. At higher volumes, there will be subtle dimensional variation in parts that are induced by the printing and as well as the subsequent processes.